

Remarks

Applicants respectfully request reconsideration of the present application in view of the above-amendment and following remarks. Claim 26 has been amended, and no claims have been cancelled or added. Therefore, claims 1-24 and 26 are pending in the present application.

Independent claim 26 has been amended to change the term "first electrolyte" to "first electrode precursor" to provide proper antecedent basis therein. Applicants request that the amendment to claim 26 be entered.

Claims 1-24 and 26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,663,999 to Van Berkel et al. ("the Van Berkel reference") in view of U.S. Patent Publication No. 2008/0038611 to Sprengle et al. ("the Sprengle reference"). Applicants respectfully traverse this rejection.

Independent claim 1 is directed to a method of producing a ceramic assembly. The method includes disposing an electrode precursor on an electrolyte precursor having an electrolyte sintering shrinkage; disposing a stabilizer precursor having a stabilizer sintering shrinkage on the electrode precursor on a side opposite the electrolyte precursor to form a precursor assembly, wherein a difference between the electrolyte sintering shrinkage and the stabilizer sintering shrinkage is less than or equal to $\pm 1\%$; and sintering the precursor assembly to form the ceramic assembly comprising a stabilizer layer, electrode, and electrolyte, wherein a surface of the ceramic assembly has less

than or equal to about 5.0 degrees camber, as measured from the horizontal plane.

The Van Berkel reference is generally directed to a method of fabricating an electrode support shown in the sole Figure set forth therein. The method generally includes the steps of providing an assembly including an anode support (1) made of nickel and zirconia material, applying to one side of the anode support (1) an intermediate layer (2) made up of nickel oxide and yttria-stabilized zirconia (YSZ) particles, and applying an electrolyte layer (3) comprising YSZ particles on the intermediate layer (2) on the side opposite of the anode support (1). See *Van Berkel*, Col. 1, lines 6-12; Col. 3, lines 29-55; sole Figure. In other words, the intermediate layer (2) is disposed between the anode support (1) and the electrolyte layer (3) in the assembly shown in the Van Berkel reference. See *id.*

Applicants submit that the Van Berkel reference does not teach or suggest a method of producing a ceramic assembly, comprising: disposing an electrode precursor on an electrolyte precursor having an electrolyte sintering shrinkage; and disposing a stabilizer precursor having a stabilizer sintering shrinkage on the electrode precursor on a side opposite the electrolyte precursor to form a precursor assembly as recited in claim 1. In rejecting claim 1, the Examiner stated that the intermediate layer (2) set forth in the Van Berkel reference resembles the stabilizer recited in claim 1. As mentioned above, the Van Berkel reference discloses that the intermediate layer (2) is disposed between the anode support (1) and the electrolyte later (3). The arrangement of the

components disclosed in the Van Berkel reference is not the same as set forth in claim 1. In claim 1 of the present invention, the electrode precursor is disposed between the electrolyte precursor and the stabilizer precursor. In other words, the stabilizer in claim 1 is not disposed between the electrode precursor and the electrolyte precursor as in the Van Berkel reference. As such, the Van Berkel reference does not disclose the positioning of the stabilizer precursor as in claim 1.

Moreover, the Van Berkel reference teaches away from repositioning the intermediate layer (2) so that the anode support (1) is positioned between the intermediate layer (2) and the electrolyte layer (3). The Van Berkel reference states as follows:

The application of an auxiliary or intermediate layer consisting of NiO/YSZ was found to result in filling of the larger pores of the anode substrate, thus producing a very flat surface of the anode support. . . . According to an advantageous embodiment, the particle size chosen for the intermediate layer such that the surface of the anode support only has pores smaller than about 1 μm and a minimum of defects or even is free from defects. This allows the electrolyte to be applied under optimal conditions to the support with the auxiliary layer. The electrolyte is thus fabricated free from defects.

Van Berkel, Col. 2, lines 28-50.

In view of the above statement made in the Van Berkel reference, it is apparent that the purpose of the intermediate layer (2) is to provide a "very flat surface" on the anode substrate (1) so that the electrolyte layer (3) may be fabricated free from defects when applied to the anode support (1). Therefore, in order to meet the above-referenced objective of the Van Berkel reference, the intermediate layer (2) must be positioned between the anode support (1) and the

electrolyte layer (3). Otherwise, the intermediate layer (2) would not provide the flat surface that is desired by the Van Berkel reference when applying the electrolyte layer (3). As such, the Van Berkel reference teaches away from positioning the intermediate layer (2) in any location other than between the electrolyte layer (3) and the anode support (1). For the reasons provides above, Applicants submit that the Van Berkel reference fails to teach or suggest all of the limitations set forth in claim 1 of the present patent application.

In regard to the Sprenkle reference, Applicants submit that the invention set forth in claim 1 was invented prior to the effective date of the Sprenkle reference, and therefore the Sprenkle reference is not prior art and may not be used to reject claim 1. In order to establish prior invention, Applicants may establish that the invention set forth in claim 1 was actually reduced to practice prior to the effective date of the Sprenkle reference. See 37 C.F.R. § 1.131(b). To that end, Applicants submit herewith a true and original copy of a Declaration Under 37 C.F.R. § 1.131 by Joseph M. Keller ("Keller") (the "Declaration"), one of the inventors in the above-referenced patent application, swearing behind the effective date of the Sprenkle reference. The effective date of the Sprenkle reference is the filing date thereof, which is listed as April 28, 2003. See MPEP 706.02(f), 715; *see also Sprenkle*, cover page.

It has been established in the Declaration that Svoboda and Keller conceived the invention set forth in claim 1, and Svoboda reduced the invention set forth in claim 1 to practice, on or before August 1, 2002. See 37 C.F.R. § 1.131(b); *Declaration*, ¶¶ 4, 16. In establishing the conception of the invention in

claim 1 prior to August 1, 2002, Keller states in the Declaration that he and Svoboda signed a record of invention and both took part in preparing a presentation that discloses the subject matter in claim 1. *See Declaration*, ¶¶ 4, 6, 7, 9, 10, 11, 12, 13. In establishing the reduction to practice of the invention in claim 1 prior to August 1, 2002, Keller states in his Declaration, that the above-referenced presentation includes a photograph of a ceramic assembly that Svoboda formed by performing the steps included in claim 1, and the results of a test that Svoboda conducted on one of the ceramic assemblies that he formed using the steps in claim 1 which confirmed that the camber of the resulting ceramic assembly had less than or equal to about 5.0 degrees as measured from a horizontal plane. *See Declaration*, ¶¶ 16, 17, 19, 20, 21, 22, 23, 24.

Pursuant to 37 C.F.R. § 1.131(a), all of the inventors of the subject matter of the rejected claim must submit a declaration in order to establish prior invention. *See also* MPEP 715.04. Therefore, in regard to claim 1, Robert J. Svoboda and Joseph M. Keller must submit a declaration to establish prior invention. *See* 37 C.F.R. § 1.131(a); MPEP 715.04(I)(B). As referenced above, attached herewith is the Declaration by Joseph M. Keller in support of prior invention of the invention set forth in claim 1. However, Robert J. Svoboda is unavailable to sign a declaration to establish prior invention of claim 1. Therefore, Applicants have submitted herewith a Petition to Suspend the Rules Pursuant to 37 C.F.R. § 1.183 ("Petition") requesting waiver of the signature of Mr. Svoboda required under 37 C.F.R. § 1.131. *See* MPEP 715.04(I).

In view of the foregoing, Applicants submit that the proposed combination of the Van Berkel reference and the Sprengle reference do not establish a prima facie case of obviousness because the Sprengle reference is not prior art and the Van Berkel reference fails to teach or suggest all of the limitations included in claim 1. Therefore, it is requested that the rejection of claim 1 be withdrawn. As claims 2-24 depend either directly or indirectly from claim 1, these claims are also not taught or suggested by the combination of the Van Berkel reference and the Sprengle reference for at least the same reasons that were set forth with respect to claim 1. It is requested that the rejection of claims 2-24 be withdrawn.

Dependent claim 6 includes an additional limitation that is not disclosed in the Van Berkel reference. Claim 6 depends from claim 1 and states that the stabilizer layer has a porosity of less than or equal to about 10%, and wherein fluid communication through the stabilizer layer to the electrolyte is through openings in the stabilizer layer. The Van Berkel reference states that the porosity of the intermediate layer (2) is about 40 vol%, which is outside the range set forth in claim 6. See *Van Berkel*, Col. 2, lines 51-52. Furthermore, the Examiner failed to provide any basis or reasoning for rejecting claim 6. See *Ex parte Humphreys*, 24 USPQ2d 1255 (B.P.A.I. 1992) (stating that if an examiner fails to provide a specific reason to support an obviousness rejection, he or she will have failed to establish a prima facie case of obviousness). For these additional reasons, Applicants request that the rejection of claim 6 be withdrawn.

Dependent claim 13 includes an additional limitation that is not disclosed in the Van Berkel reference. Claim 13 states that the method in claim 6 further

comprises: disposing an elastomer on the electrode precursor in a desired pattern prior to disposing the stabilizer precursor on the electrode, wherein the elastomer forms the holes in the stabilizer layer. The Examiner has not provided any basis or reasoning for rejecting claim 13. *See id.* For at least this reason, Applicants request that the rejection of claim 13 be withdrawn.

Dependent claim 17 includes an additional limitation that is not disclosed in the Van Berkel reference. Claim 17 depends from claim 15 and states that the stabilizer precursor comprises a fugitive material. The Examiner to provide any basis for rejecting claim 17, and for at least this reason, Applicants request that the rejection of claim 17 be withdrawn. *See id.*

Independent claim 26 is directed to a method of producing a solid oxide fuel cell, comprising: disposing a first electrode precursor on a solid electrolyte precursor having an electrolyte sintering shrinkage; disposing a stabilizer precursor having a stabilizer sintering shrinkage on the first electrode precursor on a side opposite the electrolyte precursor to form a precursor assembly, wherein a difference between the electrolyte sintering shrinkage and the stabilizer sintering shrinkage is less than or equal to $\pm 5\%$; disposing a second electrode precursor on a side of the solid electrolyte precursor opposite the first electrolyte; and sintering the precursor assembly to form the ceramic assembly comprising a stabilizer layer, first electrode, and electrolyte, wherein a surface of the ceramic assembly has less than or equal to about 5.0 degrees camber, as measured from the horizontal plane.

For at least the same reasons that were set forth with respect to claim 1, Applicants submit that the Van Berkel reference does not teach or suggest a method of producing a solid oxide fuel cell, comprising: disposing a first electrode precursor on a solid electrolyte precursor having an electrolyte sintering shrinkage; and disposing a stabilizer precursor having a stabilizer sintering shrinkage on the first electrode precursor on a side opposite the electrolyte precursor to form a precursor assembly as recited in claim 26.

In regard to the Sprenkle reference, Applicants hereby submit the aforementioned Declaration by Keller swearing behind the effective date of the Sprenkle reference (i.e., April 28, 2003) relative to claim 26. See MPEP 706.02(f), 715; *see also Sprenkle*, cover page. It has been established in the Declaration that Svoboda and Keller conceived the invention set forth in claim 26, and Svoboda reduced the invention set forth in claim 26 to practice, on or before August 1, 2002. See 37 C.F.R. § 1.131(b); *Declaration*, ¶¶ 5, 16. In establishing the conception of the invention in claim 26 prior to August 1, 2002, Keller states in his Declaration that he and Svoboda signed a record of invention and took part in preparing a presentation that discloses the subject matter in claim 1. See *Declaration*, ¶¶ 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. In establishing the reduction to practice of the invention in claim 26 prior to August 1, 2002, Keller states in his Declaration that the above-referenced presentation includes a photograph of a ceramic assembly that Svoboda formed by performing the steps included in claim 26, and the results of a test that Svoboda conducted on one of the ceramic assemblies that Svoboda formed using the steps in claim 26 which confirmed

that the camber of the resulting ceramic assembly had less than or equal to about 5.0 degrees as measured from a horizontal plane. See *Declaration*, ¶¶ 16, 18, 19, 20, 21, 22, 23, 24.

As noted above with respect to claim 1, pursuant to 37 C.F.R. § 1.131(a), all of the inventors of the subject matter of the rejected claim must submit a declaration in order to establish prior invention. See also MPEP 715.04. Therefore, in regard to claim 26, Robert J. Svoboda and Joseph M. Keller must submit a declaration to establish prior invention. See 37 C.F.R. § 1.131(a); MPEP 715.04(I)(B). As referenced above, attached herewith is the Declaration by Joseph M. Keller in support of the claim of prior invention. In view of Robert J. Svoboda's unavailability to sign a declaration to establish prior invention of claim 26, Applicants have submitted herewith the aforementioned Petition requesting waiver of the signature of Mr. Svoboda required under 37 C.F.R. § 1.131. See MPEP 715.04(I).

In view of the above, it is requested that the rejection of claim 26 be withdrawn.

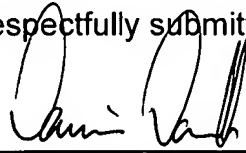
Conclusion

In light of the foregoing, Applicants submit that claims 1-24 and 26 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

The Commissioner is hereby authorized to charge the \$1,110.00 fee for the three-month extension of time, the \$180.00 fee required under 37 C.F.R. §§ 1.17(p) and 1.97(c)(2) for the Information Disclosure Statement submitted herewith, and any other fee that may have been overlooked to Deposit Account No. 50-4635.

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Respectfully submitted,



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